

# W5YI

## America's Oldest Ham Radio Newsletter REPORT

Up to the minute news from the world of amateur radio, personal computing and emerging electronics. While no guarantee is made, information is from sources we believe to be reliable.

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Fred Maia, W5YI, Editor, P.O. Box 565101, Dallas, TX 75356-5101  
Electronic mail: fmaia@internetMCI.com Website: <http://www.w5yi.org>  
Tel. 817-461-6443 FAX: 817-548-9594

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### TAPR Holds 16<sup>th</sup> Digital Communications Conference

The not-for-profit Tucson Amateur Packet Radio Corporation (TAPR) revealed some intriguing new projects at the 16th Digital Communications Conference (DCC) in Baltimore, October 10-12. The American Radio Relay League (ARRL) co-sponsored this international gathering of high-tech hams.

DCC is designed as a technical conference, with formal papers, published proceedings, and tutorial sessions. It also includes demonstrations of the latest products and concepts. There was a banquet presentation by the Japan Packet Radio Users Group (PRUG). The group is engaged in some amazing mobile radio and conferencing experiments connecting Amateur Radio and the Internet.

#### **TAPR spread spectrum radio**

TAPR's TNC-2 controller brought inexpensive data communications within reach of most amateurs, permitting packet networks to grow worldwide. TAPR aims to better that achievement, but this time with a 902-928 MHz data transceiver capable of mobile operation at hundreds of kilobits per second, with Ethernet connection to the user's PC. Amateurs will be able to utilize Internet speeds and applications via wireless links.

TAPR announced that this radio is now in the printed circuit board design stage. TAPR intends to market the unit after extensive design, testing and manufacturing. TAPR will also license the design to commercial manufacturers, as it successfully did with the TNC-2.

The radio is described in the DCC paper, "An Amateur 900 MHz Spread-Spectrum Radio Design," by Tom McDermott, N5EG, Bob Stricklin, N5BRG, and Bill Reed, WD0ETZ. They said, "A high-speed mobile data access infrastructure to the Internet has many applications for the radio amateur, and could allow the provision of services and applications not possible with current commercial technologies.

"This is especially true as the Internet performance improves to support constant-bit rate multimedia services. Current audio coding technology provides quite acceptable audio at 13 kb/s. Videoconferencing is reasonably acceptable at 112 kb/s. Web browsing is possible at any speed, but only tolerable above 28 kb/s.

"A wireless interconnection technology that could support data rates in this range would provide the ability for the radio amateur to provide audio conferencing, via the Internet, from a mobile laptop computer to anywhere in the world in real time.

"Mobile laptop videoconferencing is similarly possible. Access to databases, maps, Email, etc., anywhere on the Internet in real time would make the utility of such a service very great.

"The radio amateur, equipped with such a capability could prove invaluable in many public-service scenarios. Indeed, the Internet not only addresses many of the problems of previous-generation packet networking, in fact it provides a powerful tool in its almost universal accessibility and rich diversity of information."

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## Requirements include 20 mile coverage at 1 W

The designers require the radio to provide at least 128 kb/s throughput (more in other modes) while providing 20-mile coverage with 1-watt output power. Modes include both point-to-point and hubbed, multi-point operation.

In the latter configuration, several radios could be installed at a rooftop hub site, with one acting as a control channel and the others as data channels. This would permit multiple users to simultaneously access the hub site. Some of the channels could be dedicated to fixed, point-to-point links connecting the hub site with an Internet connection point.

The radios will utilize frequency-hopping spread spectrum, which experiments showed was more reliable in the 902-928 MHz "kitchen sink" environment than the direct-sequence spread spectrum commonly used in wireless local-area networks. The band has a wide variety of commercial, industrial and governmental uses.

The FCC already has announced it will auction licenses in 902-928 MHz for the Location and Monitoring Service (LMS, formerly Automatic Vehicle Location) for tracking, dispatching and vehicle security. A robust design could become very necessary as LMS systems go on the air around the country (although currently there appears to be little business interest in LMS for vehicle tracking.)

Asked when the radio will be available, TAPR president Greg Jones, WD5IVD said that it is a "work in progress" and that hams should check the TAPR web site for the latest developments (<http://www.tapr.org/ss>). TAPR has recently published a thorough textbook by N5EG on digital radio, and is preparing a new book, "Networking Without Wires."

## Replication of web sites by radio

Other fascinating projects presented at DCC included HamWeb by John Hansen, WA 0PTV. HamWeb is software, currently for Windows 95, which uses a channel to continuously transmit the entire file contents of a server, or a directory on a server, to users' computers.

Hansen was inspired by the "broadcast protocol" used on OSCAR satellites that efficiently distributes files without the need for individual connections. The technology could quickly duplicate an entire Web site to mobile computers at a disaster site, for example. The HamWeb client and server software is available in beta version on the TAPR web site.

## Position reporting gaining new adherents

Mark Sproul, KB2ICI, Keith Sproul, WU2Z, and Bob Bruninga, WB4APR, presented the latest developments in APRS, the Automatic Position Reporting System that has caught on around the country on 145.790 MHz. APRS takes Global Positioning System (GPS) data and

sends it in extremely short packet transmissions. APRS software displays the location of each participating station.

APRS is being used for everything from tracking bikeathon progress to robotic vision to weather prediction. APRS has enabled the recovery of stolen vehicles. It is now using 30 meter QRP HF in addition to VHF communications. TAPR sells a MIC-E encoder device that enables a user to operate an APRS station without the need for a packet TNC.

The latest version of the Sproul brothers' MacAPRS and WinAPRS software provides sophisticated map displays, (with street identification coming shortly), and supports radio direction finding and weather station inputs. APRS software also is available for DOS and Java, and APRS servers have been developed for the Internet for examination of remote APRS networks.

PerlAPRS by Richard Parry, W9IF, is an application written in the Perl computer language that performs automated actions based on APRS criteria, such as callsign and location, set by the user. PerlAPRS can cause alarms to sound, update logs, or send E-mail if an APRS unit reaches a certain location.

## Using GPS for timekeeping

Position reporting is not the only application of GPS. Tom Clark, W3IWI, demonstrated the Totally Accurate Clock (TAC-2), available from TAPR, which incorporates a GPS receiver and PC to provide extreme accuracy timekeeping based on GPS pulses. W3IWI's SHOWTIME Windows software displays the time, with audio ticks if desired, and shows which GPS satellites are in view.

The clock can be used to control experiments, to update a computer's internal clock, or as a timebase for RF applications such as propagation beacons or frequency standards. Many of the Personal Communications Service (PCS) base stations going up around the country use GPS as a timebase, and GPS antennas can be seen adjacent to the PCS transmitting and receiving antennas.

One of the most eye-opening presentations was by Yutaka Sakurai, JF1LZQ (<http://www.prug.or.jp/>) of the Japan Packet Radio Users Group (PRUG). There are more than 1.3 million hams in Japan, he reported, but the number of hams is dropping due partly, he believes, to the availability of other communications media such as cellular phones and the Internet.

But PRUG has turned some of this to advantage, by adapting for amateur service the modems available in Japan's inexpensive Personal Handyphone (cellular) devices. Ordinary dial-up Internet access is very expensive in Japan, so the members of PRUG are experimenting with various ways of obtaining access via amateur radio. They are even using Microsoft's Net Meeting conferencing software via internetworking of amateur repeaters.

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peared briefly at the event to meet with TAPR board members about issues of mutual concern between ARRL and TAPR. The two organizations have taken contrasting views at the FCC with regard to the expansion of spread spectrum.

TAPR president Greg Jones, WD5IVD, described DCC as "the time of year that the digital segment of our hobby does the Vulcan mind-meld. A lot of people have said that the Internet will be the downfall of the Amateur Radio Service.

"But to me, the Net is a great resource for sharing information and building personal relationships. By meeting folks at TAPR events, your E-mail and mailing list interactions will be more valuable because they are based on common understandings. Everything we're doing is still packet radio, even the Totally Accurate Clock which will enhance digital communications. We may use radio and the Internet, but we still thrive on meeting each other."

### World Radio Conference-97 Opens October 27

Four items of prime interest to Amateur Radio will be on the agenda when the World Radiocommunication Conference 97 (WRC-97) opens October 27 in Geneva, Switzerland. ARRL Technical Relations Manager Paul Rinaldo, W4RI, is a member of the US delegation to the conference. Others attending include IARU representatives Larry Price, W4RA, Wojciech Nietyksza, SP5FM, and Michael Owen, VK3KI. Representing Canadian amateurs on his nation's delegation will be Jim Dean, VE3IQ, of Radio Amateurs of Canada (RAC).

WRC-97 delegates will discuss the so-called "Little LEO" issue during the month long session. While the Little LEO industry's preliminary proposals to share 2 meters, 1-1/4 meters and 70 cm generated quite a stir in the amateur community last year, current US proposals do not include any plans for sharing of amateur frequencies.

Also of interest to hams is the specter of increased interference on some amateur UHF allocations from Earth Exploration Satellites (EES), used for mapping by synthetic aperture radars (SARs) that are expected to be mostly active in the Southern hemisphere. Amateur radio delegates will make known the needs of our service. WRC-97 will be asked to consider allocating the band 430-440 MHz to EES and upgrading the status of EES at 1240-1300 MHz.

Wind profiler radar systems operating near 50, 449 and 1000 MHz also bear watching because of the potential for interference to Amateur Radio. These systems are used by weather forecasters to look at wind patterns in the higher atmosphere.

WRC-97 delegates also will set the agenda for WRC-99, where the potential exists to establish a worldwide 40-meter allocation. The current US concept calls for a "harmonized" band at 6900 to 7200 kHz that would be available to hams around the globe. This would

mean hams would shift down by 100 kHz while broadcasters moved 100 kHz up the band. Yet to be determined is how fixed services would be handled in the realignment.

The IARU is committed to the goal of a 300-kHz worldwide exclusive allocation for 40 meters. Right now, only 7000 to 7100 kHz is available in Regions 1 and 3, where broadcasters dominate the upper 200 kHz of the band. WRC-97 is scheduled to conclude November 21.

*(Editor's Note: The above is the text of ARRL Bulletin No. 62. It is interesting that the League did not mention in conjunction with the setting of the WRC-99 agenda at WRC-97 - the most important preliminary amateur radio agenda item. It is, of course, that the ITU will consider Article 25, the international amateur radio regulations. The preliminary agenda for WRC-99 was set at WRC-95.*

*The face of ham radio could drastically change depending upon what happens at WRC-99 which will be convened in mid-October 1999. There continues, however, to be a rumor floating around in the international telecommunications community that the Article 25 amateur radio issue could be postponed to a later conference due to a very full WRC-99 agenda.*

*Perhaps the IARU will support the postponement as a way of extending the current CW licensing requirement another couple of years. Both IARU Region 1 and 3 want no changes in the current international Morse licensing requirement. Region 2 will not convene their meeting until the fall of 1998. We will have to wait and see.)*

### State Dept. Applies for CEPT Amateur Participation

The State Department has applied for US participation in the European Conference of Postal and Telecommunications Administrations (CEPT) Amateur Radio licensing system.

The move, September 22, could eventually make it easier for US hams to operate temporarily in European countries that participate in CEPT. Holders of a CEPT license could operate in CEPT-participating countries without having to apply for a reciprocal license.

"No doubt there will be some give and take between the European Radiocommunications Office (ERO) and the Department of State over the details before the US is accepted as a participant, but an important milestone has been reached," said ARRL Executive Vice President David Sumner, K1ZZ.

The application consists of a four-page letter with voluminous attachments. Last year, the FCC had asked the State Department to apply for participation in the CEPT Agreement as a non-CEPT country.

The action follows in the wake of an earlier suggestion by the ARRL to the FCC that the US take advantage of the CEPT Recommendation T/R 61-01 arrangements and issue a CEPT license that would be recognized by other participating administrations and valid for visits.

Last fall, the FCC proposed amending the Amateur Radio rules to make it easier for hams holding a CEPT license or an International Amateur Radio Permit (IARP) to operate during short visits to the US. (Thanks, ARRL)

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## CUTTING EDGE TECHNOLOGY

**■ Power companies are getting ready to enter the telecommunications world.** A British utility company and Northern Telecom, Ltd. have developed breakthrough technology that permits high-speed Internet access and digital voice communications over power lines.

By separating data signals from electricity, data traffic speeds of 1M bit/sec. have been achieved -- 35 times the speed of a 28.8 K bit/sec. modem! To activate the service, customers install a small box (cost about \$300) next to their electric meters which is connected to their PC through ordinary coaxial cable.

## EMERGING COMMUNICATIONS

**■ Are you paying too much for cellular phone service?** You probably are if there is at least one PCS (Personal Communications Service) service operating in your area. Telecom researcher, the Yankee Group said in a "white paper" that wireless prices have plunged an average of 25% where there is PCS competition. PCS prices average about 20% below analog cellular. Per minute prices will drop to an average of 20¢ in 1999 versus 45¢ per minute in markets with analog cellular only.

**■ With half of its 66 interconnected satellites orbiting 420 nautical miles above the earth, the Iridium LEO personal communications network has been successfully tested by Motorola.** They need 600,000 subscribers to break even. Iridium plans to have more than 4 million users within 5 years with revenues exceeding \$4 billion.

The system will simplify communications for business professionals, travelers, residents of rural or undeveloped areas, relief teams, and other users who need the features and convenience of a reliable wireless handheld phone for worldwide use. It will also end the need for ham radio communications during times of natural disasters which cut off landline communications.

Iridium subscribers will communicate using shirt-pocket size handheld telephones and pagers to-and-from virtually anywhere in the world. By utilizing low earth orbit satellites, there will be virtually no voice delays, while making fax and data communication possible. In addition to direct satellite service, Iridium also plans to connect to existing cellular and public switched telephone

networks. Portable solar-powered phone booths will provide public access in remote areas that are underserved by existing telecommunications. Service begins next fall. The orbiting network is tied to eleven ground stations located around the world, nine of which are already completed.

**■ Progress comes to the nation's truckers!** It used to be that CB was the mainstay communications mode of the over-the-road long haul trucker. More and more truck stops are now adding Internet connections for laptop computers and rental computers in their "cyberlounges!"

## SOFTWARE DEVELOPMENTS

**■ Things are not going well at Netscape. It appears that Netscape's Marc Andreessen has been demoted.** Andreessen, the boy wonder who invented the first Internet "Mosaic" browser in the early 1990's while in college (University of Illinois at Champaign-Urbana), has been reassigned to the position of Vice President of Products. He had been, Chief Technology Officer.

Iowa-born Marc, only 25 years old, saw his net worth rocket to more than \$50 million when Netscape went public. Andreessen and Jim Clark co-founded Netscape which they originally wanted to call "Mosaic" - but the university would not release the rights to that name.

Both Netscape and eventually Microsoft paid big bucks to the University of Illinois for the licensing rights to further develop Mosaic. They went their separate ways but the Netscape browser - being first out of the starting block - captured the early lead. The Microsoft Explorer browser is now playing catchup and is steadily gaining ground on the Netscape Navigator.

Eric Hahn, who replaces Andreessen, also will be added to Netscape Communications Corp's (Mountainview, CA) new executive committee. Hahn was previously a Senior Vice President with Netscape, but in a lesser position as manager of Server Products.

From its one-time high of \$87, Netscape's stock sank into the low \$20s and - until recently - was hanging around the mid-\$30s. It jumped to nearly \$40 when the US said Microsoft could not use its operating system clout to elbow its way onto desktops. (See next story.) We even heard a rumor that Oracle was contemplating acquiring Netscape.

**■ Microsoft's position that PC mak-**

**ers must either accept their preloaded Internet browser or forego Windows 95 is unlawful** says U.S. Attorney Janet Reno. "Anyone can give away a browser, but no one can force it onto a computer desktop."

The Justice Dept. says that Microsoft is taking unfair advantage of competitors and is in contempt of a 1995 consent decree. The agency seeks \$1 million per day until Microsoft stops requiring personal computer manufacturers to accept Internet Explorer as a condition to receiving Windows 95. The penalty is the largest ever, but still only 10% of Microsoft's daily profit. (Sales are \$50 million every business day!)

Microsoft believes that their Internet Explorer browser is an operating system enhancement. On the other hand, personal computer makers do not like being told what to do.

**■ Microsoft operating systems power more than 200 million desktops - virtually every PC sold** - but capture only 30% of the browser market versus an 8% share a year ago. It will be interesting to see how Microsoft handles the new Windows 98 (to be released in the Spring) which was to have the IE 4.0 preloaded.

A new Windows 98 feature will allow users to get selected Web content for free over the vertical blanking interval. The VBI is an unused portion of the television broadcast spectrum. Computers with inexpensive tuner cards (\$50 to \$100) will be able to receive the Internet without a connection.

**■ Microsoft is also being sued by Sun Microsystems for violation of a licensing agreement.** According to Sun, the new IE 4.0 browser lacks certain Java capabilities it feels important. Java represents a dangerous threat to Microsoft's advantage in developing software. Sun doesn't want the core parts of the language to be changed since programmers using Java will find that some features won't work on IE 4.0.

**■ The New Millennium is just two years away! And with it comes computer problems** - especially if you are using a 2-character date field in your data!

The Gartner Group, a research firm, says that by the end of 1999, half of all global computer systems - and 40% of those located in North America - will not be fully "year 2000 compliant." Ninety percent will have achieved "operational compliance" by patching up their systems.

The big problem is cost. There is just not enough money to upgrade everything. And many companies overseas generally do not think there is a problem at all!

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## COMPUTERS & HARDWARE

■ **Will the new Chief Executive Officer of Apple Computer (Cupertino, CA) be Steve Jobs**, its former founder, now board member and temporary CEO? It could happen. At a recent question and answer session following a keynote speech, at the Macromedia User Conference held in San Francisco, Jobs' said that he would consider that possibility during an upcoming vacation.

He is quoted as saying, "I'm planning to go to Hawaii for a week, walk on the beach and think about it." Several CEO candidates have been lined up, but a question arises is to whether a new CEO would be able to work with a Board of Directors who apparently will be calling the shots.

■ **TechAmerica has scheduled the Grand Opening Celebration of its second store for November 20<sup>th</sup>** in the Atlanta suburb of Doraville, Georgia.

TechAmerica is the new equipment and parts store geared to electronics enthusiasts being opened by Tandy/Radio Shack. The first one opened in Denver.

■ **Radio-controlled gas pumps have arrived!** Mobil Corp. has a new "Speedpass" gas delivery system that uses an electronic reader to communicate with magnetic tags installed in a key ring or attached to a car's back windshield. It works in the same manner as "tolltags" which permit drivers to bypass toll booth collection. Purchasers of gasoline never have to look for their credit card! A red light on the pump goes on when you drive in and you drive away after pumping the gas. A computer inside the station automatically handles the charge. The nation's first "Speedpass" gas station opened last week here in Dallas.

## INTERNET NEWS

■ An interesting research report out of London-based Ovum, Ltd. maintains that **cybershoppers of the future will order groceries, merchandise, vacations and movies using their television sets** rather than complicated and expensive personal computers. Fifty 50 million TVs will be capable of using the Internet by 2005 and 100 million non-PC Internet access devices will be in existence. Other competitors will include the *Network Computer*, a stripped-down PC which gets its power from the Internet and telephones with screens lashed to the Web. New methods of home deliv-

ery such as satellite, cable, beefed-up telephone and domestic electricity will put the computer industry on the defensive. (See: <<http://www.ovum.com>>)

## WASHINGTON WHISPERS

■ **The FCC has deregulated the nation's 2.1 million pay phones.** You may want to think twice about using a pay phone in the future - especially at places like the airport, sports arenas and various other "captive audience" sites where commissions are paid by the pay phone provider. The higher the commission, the higher the cost of a phone call.

As of October 7th, price cap regulations have been abolished and pay phone owners may now charge whatever the market will bear. The 10¢ to 25¢ phone call will give way to 35¢ to 50¢. It has already started! But you also could see \$1 local phone calls! And new FCC rules also permit a charge for local directory assistance.

And look for a big jump in the number of private pay phone operators and individual businesses which, through new computerized management technology, permit owners of high traffic locations (such as restaurants and hotels) to retain all revenues generated by the phone. Their only cost is a business line and the pay phone.

The new FCC rules, which stem from the *Telecommunications Act of 1996*, are aimed at letting market forces, instead of state regulators, set rates. Public Utility Commissions and consumer advocate groups are not happy with the new rules which they say impact consumers who are not in a position to "shop around" and who are least able to afford an increase.

■ **The danger of computer attacks is real!** That's the conclusion of a study delivered to the White House last week by a presidential commission on cyberterrorism. The classified report said online radicals or rogue nations could mount a future attack on the United States which could shut down key elements of the nation's underpinning ...including failure of the banking, financial markets, power grid, telecommunications and transportation systems. The report recommends additional research, a nationwide education program and revised laws to deal with electronic attacks through the Internet.

■ **HDTV, the new digital high resolution television, is getting off to a very poor start.** Broadcasters can't seem to get their act together. They want high definition television to follow the broadcast

model but are reluctant to invest the bucks to get it going.

Never shy to invest time, people and money, Microsoft's Bill Gates is not waiting. His idea of HDTV is a PC disguised as a TV - not a television that acts like a computer. The fight is over standards.

Last week, representatives from Microsoft, Intel and Compaq Computer went to Tokyo to join the Japanese government's study group on digital satellite broadcasting in the 21<sup>st</sup> century. The three U.S. companies more or less dictate worldwide computer software, technical and hardware standards. They lead, and the rest follow.

The *Telecommunication Technology Council* study group was established by Japanese Ministry of Posts and Telecommunications. The three U.S. firms have proposed formats that will work better with computers than with television sets. On the other hand, Japanese consumer electronics makers still want digital TV to be similar to today's analog broadcast television.

In all, five different formats are being considered - and it is possible that all could be approved. Japan plans to introduce digital satellite broadcasting in 2000 when it launches the BS-4 broadcasting satellite. The current Japanese analog DBS (direct broadcast satellite) service has 10 million subscribers.

The FCC has said that it will leave digital TV technical standards up to the marketplace. While the television industry is holding back and contemplating a long transition period to digital (and the longer the better as far as they are concerned), the PC industry is plowing straight ahead.

It's my bet that HDTV shows up first on your PC and stays there. In my view, the new Internet Explorer 4.0 browser is the first rudimentary attempt to bring digital video to the masses. Windows 98 will carry it a step further.

At present the television and cable people own the real estate ...the broadcast licenses and the wireline. But the computer industry is moving in on many fronts - acquiring cable companies and moving broadcast toward PCs. And few broadcasters seem to be aware - or even care what Microsoft is doing. A big mistake.

■ **Food for thought! Amateur radio is facing the same challenge as commercial radio and television broadcasting.** Even though ham radio is a technical hobby, we haven't kept up with technology. The transition from manual analog to automatic digital is painful. Just ask the commercial maritime radio operator who can't let go of manual telephony.

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Amateur repeater owners want circa 1970's analog technology to continue forever. Its what we have ...and like their commercial counterpart, its paid for and runs so "...lets keep it." Although authorized, I am not aware of a single amateur radio trunked digital communications system. As Pogo said, we are our own worst enemy!

Meanwhile, personal and hobby communications heads to the PC where voice and video over global networks are making big inroads. Call it "chat" or call it QSO. It is the same thing. How long will it be before licensed ham radio becomes unlicensed ham wireline networking?

**■ Netscape and America Online have just announced a new advertising-supported technology called "Instant Messenger"** It lets anyone on the Internet type quick back-and-forth messages in real time to any of AOL's twelve million subscribers or anyone else on the Web who has the software. AOL also has a feature called "The Buddy List" that notifies you when one of your friends log on. With the addition of VON (voice on the network) or video, you have instant two-way "ham radio-like" communications - only better quality, with more features ...and more predictable.

The next big frontier in ham radio will be the integration of radio with wireline. Radio works best for those who move around and can't be tethered to a wire. Will base ham radio stations become obsolete? It appears to me that they could. Dealers are already report taking a big sales "hit" in this area.

**■ On the other hand, maritime manual telegraphy is not completely dead!** Although GMDSS (the new Global Distress and Safety System ...a combination of digital and satellite communications) is being phased in at sea, manual Morse apparently is still used somewhat. The following GLOBE WIRELESS news story was sent in to us by Ted K. Phelps, W8TP - a shipboard radio officer:

**CW Super-Station Operator at Globe Wireless Saves a Life at Sea - Radio Officer in California Alerts Authorities to Man-Overboard in the Gulf of Mexico**

Half Moon Bay, California (August 8, 1997): The life of a ship's cook was saved today by the efforts, in part, of an alert Radio Officer at the CW Super-Station operated by Globe Wireless in Half Moon Bay, California.

Radio Officer Walter J. Kane, III was on duty at the CW Super-Station control point in California. From there he was

monitoring the receivers connected to high-gain antennas at four radio stations on the U.S. East, Gulf and West coasts (KFS, KPH, WCC and WNU).

He heard a distress call from the vessel Oituz and relayed the information to the United States Coast Guard [which no longer monitors 500 kHz]. The Coast Guard, in turn, called in the Mexican Navy who effected the rescue of the, by then, very wet cook.

The detailed account below is in Mr. Kane's own words: At approximately 1745 UTC, I detected a weak Morse Code signal on one of my local scanners calling WCC. I answered the call, from the general cargo vessel Oituz, radio call sign YQIE, (on 8 MHz) and received a message which read:

FROM MV OITUZ YQIE TO ALL SHIPS STOP PSN 1848N/09459W FROM VERA CRUZ TO FRONTERA REPORTED MAN OVERBOARD / COOK DESPINA GHEORGHE / MALE / ROMANIAN NATIONALITY STOP (signed) MASTER

I asked the ship to standby and telephoned the U.S. Coast Guard Rescue Coordination Center (RCC) in New York who then teleconferenced me with the Duty Officer at USCG District 8 (New Orleans). The Duty Officer plotted the vessel's position; it seems the vessel was actually in Mexican territorial waters, near Vera Cruz, Mexico, outside the jurisdiction of the USCG. RCC asked me to ask the vessel if they were searching the area.

With an exchange of Morse Code messages, the Captain responded that he had a lifeboat in the water and was searching. Upon relaying that information, the USCG indicated that all they would do was pass the information to the Mexican Navy. Later, I called Petty Officer Taylor at USCG District 8 (who)...told me that they had... (relayed) the message...to the Mexican Navy.

At approximately 1915 UTC the ship's radio officer called, using Morse Code, to say:

1850 UTC CREW MEMBER REPORTED MISSING WAS FOUND ALIVE BY MEXICAN NAVY STOP THANKS FOR YOU AND ALL ALERTED STATIONS

I called Petty Officer Taylor back to give him the good news and his response was: "I feel good today, knowing I helped save someone's life." I replied: "Me, too."

A short time later the ship sent a message to its owners which read, in part, 2/8/1600LT/2100UTC S.A.R. OPERATION FINISHED STOP COOK DESPINA GHEORGHE OVERBOARD SAVED ALIVE BY MEXICAN NAVY IN PSN 1848N/09459W STOP

PATIENT AT PRESENT ON BOARD MEXICAN NAVY UNDER MEDICAL ASSISTANCE IN ROUTE TO COATSA COALCOS FOR REPATRIATION STOP (End Quote)

## AMATEUR RADIO

■ Barring any last minute cash infusion (which is not expected) "Ham Radio and More," the nationally syndicated commercial radio talk show will air its last broadcast on October 26<sup>th</sup>. Its host, Len Winkler, KB7LPW has aired the weekly show from Phoenix for 6 1/2 years over a network of AM and short-wave (WWCR 5070 kHz) radio. Len cited a "...lack of financial support from most of the industry ...and 'our trade organization' as the reason for the shutdown" He added "It has been fun and a great learning experience. I wish the amateur radio hobby/service the best, and will remain a loyal user and enthusiast."

On September 27<sup>th</sup>, Len opened a table tennis club ironically called "Table Tennis and More" in Phoenix. The store sells table tennis equipment and supplies ...and rents tables to users. A web page has been set up at: <<http://www.goodnet.com/~lenwink/ttmopen.htm>>

■ The FCC has asked for final comments on the draft version of their Amateur Radio Supplement "B" - the addendum to OET Bulletin No. 65 'Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields.' As mentioned in our last Report, the FCC selected a simplified Compliance Chart that the W5YI Group developed for inclusion in Supplement "B".

We have been contacted by Ed Hare, W1RFI who heads up the ARRL Laboratory. He told us that he liked our concept and suggested two enhancements to the W5YI Compliance Chart. First he felt that additional levels of antenna gain should be shown that would apply to different types of amateur antennas. Ed also felt strongly that the chart should include a ground-reflection factor which generally lengthens the compliance distance.

Ed and I collaborated on revising the charts and you will find them on the next two pages. To use them to determine if your station conforms to the FCC's RF exposure limits - simply determine your station's antenna gain and power level on the various ham bands. Note two distances are given (in meters) from the transmitting antenna. One is for the "Controlled" environment - the other for the "Uncontrolled" general population. It is an easy, quick way to complete your "routine evaluation."

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## The W5YI Radiofrequency Exposure Evaluation Charts

TABLE 3. (Submitted by Fred Maia, W5YI Group and enhanced by Ed Hare, W1RFI, ARRL.)

Estimated distances in meters from transmitting antennas necessary to meet FCC power density limits for Maximum Permissible Exposure (MPE) for either occupational/ controlled exposures ("Con") or general population/uncontrolled exposures ("Unc") using typical antenna gains for the amateur service and assuming 100% duty cycle and maximum surface reflection. Chart represents worst case scenario.

Freq (MHz/Band) (MF/HF)	Antenna Gain (dBi)	Distance from antenna (meters) and the necessary environment							
		Peak Envelope Power (watts)							
		100 watts		500 watts		1000 watts		1500 watts	
Con.	Unc.	Con.	Unc.	Con.	Unc.	Con.	Unc.	Con.	Unc.
2.0 (160m)	0	0.1	0.2	0.3	0.5	0.5	0.7	0.6	0.8
2.0 (160m)	3	0.2	0.3	0.5	0.7	0.6	1.06	0.8	1.2
4.0 (75/80m)	0	0.2	0.4	0.4	1.0	0.6	1.3	0.7	1.6
4.0 (75/80m)	3	0.3	0.6	0.6	1.3	0.9	1.9	1.0	2.3
7.3 (40m)	0	0.3	0.8	0.8	1.7	1.1	2.5	1.3	3.0
7.3 (40m)	3	0.5	1.1	1.1	2.5	1.6	3.5	1.9	4.2
7.3 (40m)	6	0.7	1.5	1.5	3.5	2.2	4.9	2.7	6.0
10.15 (30m)	0	0.5	1.1	1.1	2.4	1.5	3.4	1.9	4.2
10.15 (30m)	3	0.7	1.5	1.5	3.4	2.2	4.8	2.6	5.9
10.15 (30m)	6	1.0	2.2	2.2	4.8	3.0	6.8	3.7	8.3
14.35 (20m)	0	0.7	1.5	1.5	3.4	2.2	4.8	2.6	5.9
14.35 (20m)	3	1.0	2.2	2.2	4.8	3.0	6.8	3.7	8.4
14.35 (20m)	6	1.4	3.0	3.0	6.8	4.3	9.6	5.3	11.8
14.35 (20m)	9	1.9	4.3	4.3	9.6	6.1	13.6	7.5	16.7
18.168 (17m)	0	0.9	1.9	1.9	4.3	2.7	6.1	3.3	7.5
18.168 (17m)	3	1.2	2.7	2.7	6.1	3.9	8.6	4.7	10.6
18.168 (17m)	6	1.7	3.9	3.9	8.6	5.5	12.2	6.7	14.9
18.168 (17m)	9	2.4	5.4	5.4	12.2	7.7	17.2	9.4	21.1
21.145 (15m)	0	1.0	2.3	2.3	5.1	3.2	7.2	4.0	8.8
21.145 (15m)	3	1.4	3.2	3.2	7.2	4.6	10.2	5.6	12.5
21.145 (15m)	6	2.0	4.6	4.6	10.2	6.4	14.4	7.9	17.6
21.145 (15m)	9	2.9	6.4	6.4	14.4	9.1	20.3	11.1	24.9
24.99 (12m)	0	1.2	2.7	2.7	5.9	3.8	8.4	4.6	10.3
24.99 (12m)	3	1.7	3.8	3.8	8.4	5.3	11.9	6.5	14.5
24.99 (12m)	6	2.4	5.3	5.3	11.9	7.5	16.8	9.2	20.5
24.99 (12m)	9	3.4	7.5	7.5	16.8	10.6	23.7	13.0	29.0
29.7 (10m)	0	1.4	3.2	3.2	7.1	4.5	10.0	5.5	12.2
29.7 (10m)	3	2.0	4.5	4.5	10.0	6.3	14.1	7.7	17.3
29.7 (10m)	6	2.8	6.3	6.3	14.1	8.9	19.9	10.9	24.4
29.7 (10m)	9	4.0	8.9	8.9	19.9	12.6	28.2	15.4	34.5

Note: Multiply above distances by 0.707 if duty cycle is 50% - such as during a typical back and forth communications exchange. To convert from meters to feet multiply meters by 3.28. Distance indicated is shortest line-of-sight distance to point where MPE limit for appropriate exposure tier is predicted to occur.

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## The W5YI Radiofrequency Exposure Evaluation Charts

For the VHF and UHF Amateur Bands - All distances are in meters

Freq (MHz/Band (VHF/UHF)	Antenna Gain (dBi)	Distance from antenna (meters) and the necessary environment Peak Envelope Power (watts)							
		50 watts PEP		100 watts PEP		500 watts PEP		1000 watts PEP	
		Con.	Unc.	Con.	Unc.	Con.	Unc.	Con.	Unc.
50 (6m)	0	1.0	2.3	1.4	3.2	3.2	7.1	4.5	10.1
50 (6m)	3	1.4	3.2	2.0	4.5	4.5	10.1	6.4	14.3
50 (6m)	6	2.0	4.5	2.8	6.4	6.4	14.2	9.0	20.1
50 (6m)	9	2.8	6.4	4.0	9.0	9.0	20.1	12.7	28.4
50 (6m)	12	4.0	9.0	5.7	12.7	12.7	28.4	18.0	40.2
144 (2m)	0	1.0	2.3	1.4	3.2	3.2	7.1	4.5	10.1
144 (2m)	3	1.4	3.2	2.0	4.5	4.5	10.1	6.4	14.3
144 (2m)	6	2.0	4.5	2.8	6.4	6.4	14.2	9.0	20.1
144 (2m)	9	2.8	6.4	4.0	9.0	9.0	20.1	12.7	28.4
144 (2m)	12	4.0	9.0	5.7	12.7	12.7	28.4	18.0	40.2
222 (1.25m)	0	1.0	2.3	1.4	3.2	3.2	7.1	4.5	10.1
222 (1.25m)	3	1.4	3.2	2.0	4.5	4.5	10.1	6.4	14.3
222 (1.25m)	6	2.0	4.5	2.8	6.4	6.4	14.2	9.0	20.1
222 (1.25m)	9	2.8	6.4	4.0	9.0	9.0	20.1	12.7	28.4
222 (1.25m)	12	4.0	9.0	5.7	12.7	12.7	28.4	18.0	40.2
450 (70cm)	0	0.8	1.8	1.2	2.6	2.6	5.8	3.7	8.2
450 (70cm)	3	1.2	2.6	1.6	3.7	3.7	8.2	5.2	11.6
450 (70cm)	6	1.6	3.7	2.3	5.2	5.2	11.6	7.4	16.4
450 (70cm)	9	2.3	5.2	3.3	7.3	7.3	16.4	10.4	23.2
450 (70cm)	12	3.3	7.3	4.6	10.4	10.4	23.2	14.7	32.8
902 (33cm)	0	0.6	1.3	0.8	1.8	1.8	4.1	2.6	5.8
902 (33cm)	3	0.8	1.8	1.2	2.6	2.6	5.8	3.7	8.2
902 (33cm)	6	1.2	2.6	1.6	3.7	3.7	8.2	5.2	11.6
902 (33cm)	9	1.6	3.7	2.3	5.2	5.2	11.6	7.3	16.4
902 (33cm)	12	2.3	5.2	3.3	7.3	7.3	16.4	10.4	23.2
1240 (23cm)	0	0.5	1.1	0.7	1.6	1.6	3.5	2.2	5.0
1240 (23cm)	3	0.7	1.6	1.0	2.2	2.2	5.0	3.1	7.0
1240 (23cm)	6	1.0	2.2	1.4	3.1	3.1	7.0	4.4	9.9
1240 (23cm)	9	1.4	3.1	2.0	4.4	4.4	9.9	6.3	14.0
1240 (23cm)	12	2.0	4.4	2.8	6.2	6.2	14.0	8.8	19.8

Note: Multiply above distances by 0.707 if duty cycle is 50% - such as during a typical back and forth communications exchange. To convert from meters to feet multiply meters by 3.28. Distance indicated is shortest line-of-sight distance to point where MPE limit for appropriate exposure tier is predicted to occur.

Amateur radio operators are required to determine that their station conforms to the FCC's radiofrequency exposure limits when the transmitter power level is above certain threshold levels. (These thresholds are on 160-40m 500W, 30m 425W, 20m 225W, 17m 125W, 15m 100W, 12m 75W, 10-1.25m 50W, 70cm 70W, 33cm 150W, 23cm 200W, and the 13cm and shorter wavelength bands

250W.) This is known as a "routine evaluation."

The "Controlled" environment applies to amateur operators, their families and guests who are informed of the potential for RF exposure. The "Uncontrolled" environment applies to the general public - such as residential neighbors - who are in close proximity to the station.

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## Amateur Mini-Satellite to Commemorate Sputnik

The conquest of Space began with the launching of the first artificial satellite : Sputnik-1 was placed in orbit by the USSR on October 4, 1957. "Sputnik" means "companion" in Russian.

Sputnik-1 was an 18 inch sphere made of aluminum weighing about 200 pounds. It circled the Earth every 96 minutes and disintegrated upon re-entering the atmosphere on January 4, 1958.

A flight model of the Sputnik PS-2 "School Satellite" has now arrived on Mir. It was shipped from the Baikonur Cosmodrome on the cargo ship *Progress 36*. The model Sputnik was assembled by students in Russia and equipped with a 2-meter ham radio transmitter by students in France.

It was to have been hand released during an Extra-Vehicular Activity (EVA) on October 4<sup>th</sup> - the 40<sup>th</sup> anniversary of the original Russian Sputnik-1. Arrival of the PS-2 model satellite on Mir was delayed by the rescheduling of the supply vehicle.

The minisatellite will transmit the original "beep-beep" with 200 mW on 145.80 MHz FM in the 2 meter ham band. The battery capacity will allow operation for a minimum of one month. For details see <http://www.-oceanes.fr/~fr5fc/spoutnik.html>

The world's second artificial satellite, the 1250 pound Sputnik-2 was launched by the USSR on November 3, 1957. On board the 1250 pound satellite was the first living organism, a dog named Laika (*Huskie*). Sputnik-2 was not designed for recovery and Laika died in orbit. The satellite burned up after entering the atmosphere on April 14, 1958.

The following October 13<sup>th</sup> special bulletin originated from AMSAT-DL, the German affiliate of the Radio Amateur Satellite Corporation. It has been slightly edited for clarity.

## Amateur Radio Phase 3D Satellite Report

During the last couple of weeks there has been extensive media-coverage of ARIANE 502, some of it with very little relationship to the facts. With this release we would like to put an end to some of the speculation and present the situation as it really exists today.

At the beginning of this year, the European Space Agency (ESA) analyzed the flight-records of the ill-fated flight ARIANE 501 and as a consequence, the vibration specifications for AMSAT P3-D were more than doubled on the AR-502 flight.

AMSAT then immediately asked a specialist to analyze the impact of this change. This resulted in a list of modifications required for P3-D, and work was started without delay to implement them. All flight-ready modules had to be removed from the satellite. The mechanical structure had to be partially disassembled and reinforcements and other components had to be added to harden P3-D for the new AR-502 flight environment.

Although not our fault, AMSAT's completion schedule was delayed and we got out of step with ESA-planning by 4 to 6 weeks. AMSAT was obliged to inform ESA about this turn of events, and initially ESA accepted this situation since there was also considerable schedule uncertainty concerning the launcher. It was agreed to make a decision regarding the availability of P3D in early September.

In August, ESA unilaterally terminated AMSAT's contract; maintaining that the launch would occur with near-certainty by the end of September. Our contract stipulated that AMSAT would have to provide a dummy-mass to simulate the mass of P3-D within the SBS adapter. Contrary to the contractual requirement, ESA then decided that AMSAT would not have to provide the dummy-mass. The reason probably was that the flight-mass for AR-502 had been reduced by about the same amount as the mass of P3-D. This was fortunate, because AMSAT thus saved the expenditure for the dummy-mass. But the SBS built by AMSAT remains part of the AR-502 payload. The SBS had been purchased by ESA from AMSAT which was part of the original contract. Immediately after the AR-502 launch (now believed to be "October 28 at the earliest"), AMSAT and ESA will have enough facts to search for an amicable solution which will guarantee an early launch of P3-D taking into consideration the actual ARIANE flight-planning.

This series of events is very regrettable, but our contract leaves us little choice but to accept the situation. For ESA, the successful launch of AR-502 has highest priority and precludes any scheduling risks on our behalf. Unfortunately, this means a launch delay for AMSAT. But we should not forget that 16 amateur-spacecraft were launched on ARIANE which constitutes a record in its own right of support of our cause.

Thus it would not be helpful to jeopardize the present negotiations by speculation or unpleasant comments. Both sides are working very hard to find an acceptable solution towards a new flight-opportunity for AMSAT P3-D. We are certain that P3-D will be launched next year on an ARIANE. (End of edited bulletin.)

## Amateur Radio on the ISS

In early October, the following ground-breaking announcement was made to the international delegates that comprise the current Amateur Radio on the International Space Station (ARISS) team:

"Dear Delegates: Our joint collaboration at the ARISS International Conference last November was extremely successful. The signed *Memorandums of Understanding* representing our combined commitment to develop a single, coordinated amateur radio station on ISS were presented to the top ISS officials. NASA has given us a commitment, Amateur Radio is now an official payload of the International Space Station."

For the past few years, the SAREX Working Group

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and last November - the ARISS-International team, have met with members of the International Space Station (ISS) Program Office to gain acceptance of amateur radio on the space station. These efforts, as well as discussions held this past month with ARISS team member Matt Bordelon, KC5BTL, and the ISS Payloads Office at the Johnson Space Center in Houston, have led to the following plan for amateur radio on ISS.

1. First, the delivery of a transportable amateur radio station. With the first crew scheduled to arrive in January 1999 for a 5 month stay; it must provide the basic capabilities that will allow the crew to establish voice and packet contacts with friends, family, school groups and other amateur radio operators. It must be capable of operating from within the Russian Service Module, a module with good Earth visibility and the primary crew residence during the early part of the assembly sequence.
2. External pallets will provide the second capability and location for amateur radio equipment. The EXPRESS pallets, located on the S3 (starboard) truss segment, are a perfect location for potential repeater and micro-sat-type payloads. These pallets, which are due to arrive on ISS-UF4 in January 2002, have power, thermal, and telemetry connections. They also have good Earth visibility. Each pallet will be installed robotically.
3. The permanent station will provide the third distinct capability. This permanent station is expected to house the most complete amateur radio station with the greatest functionality. The U.S. Habitation Module, currently scheduled for delivery sometime in 2002, will have good Earth visibility and plenty of feed-throughs for external antennas. During the international partners meeting in Houston, the team agreed that this station should include slow-scan TV, fast-scan TV, packet, voice, and experimental modes. Moreover, the plan is for the station to include several frequency bands and modes (SSB & FM) and have the ability to interface with the ISS audio and video subsystems.

AMSAT-NA Vice President for Manned Space Programs, Frank Bauer, KA3HDO, announced: "This is truly a monumental decision which will solidify the future of amateur radio on manned space vehicles". He continued, "As our space explorers occupy the international space station and eventually venture to worlds beyond, amateur radio will continue to provide the adventures of space flight directly to radio amateurs, students and the general public on Earth".

When he learned of the decision to make amateur radio an official payload on ISS, Joerg Hahn, DL3LUM, from the German SAFEX team stated: "Thank you for your very positive mail ...these are very stimulating

news...it is a good sign to know that the ham activities will be an official part of ISS".

Like the current SAFEX, MAREX, MIREX and SAREX programs, the ARISS international partners are striving to develop an amateur radio station that will enable experimentation, promote interest in amateur radio, and spark student's interest in the science and technology fields. The ARISS team includes members from Great Britain, Germany, Italy, France, Japan, Russia, Canada and the United States. (*Bulletin from the SAREX Working Group.*)

## The International Space Station (ISS)

The ISS is basically an orbiting science institute in space capable of performing long-duration research in the materials and life sciences areas in a nearly gravity-free environment. It aims to accelerate breakthroughs in technology.

Construction of the ISS begins in June 1998 - only nine months away - with the launch of the U.S.-funded FCG (Functional Cargo Block) from Russia on a Russian Proton rocket. The following month, Space Shuttle assembly mission STS-88 will launch the first U.S.-built station element, Node-1. A total of 45 launches will be required over five years to complete the facility.

When completed, the Station will have a wing-span of 356 feet and will be 290 feet long - bigger than a football field. It will weigh about 500 tons and will provide living space for up to seven astronauts and scientists. The pressurized living and working space aboard the completed station will be more than 46,000 cubic feet, roughly equivalent to the passenger cabin volume of two 747 jetliners.

In January 1999, an international crew of three (one American and two Russians) will begin living aboard the International Space Station. They will spend five months aboard the Station.

There are 16 cooperating nations participating in the project, including the United States, Canada, Japan, Russia and 11 member nations of the European Space Agency (ESA) - Belgium, Denmark, France, Germany, Italy, Netherlands, Norway, Spain, Sweden, Switzerland and the United Kingdom. In addition, Brazil and Italy have signed on as payload participants.

The ISS will orbit at an average altitude of 220 miles, at an inclination of 51.6 degrees to the Equator. The Space Station will cost every American taxpayer about eight dollars per year.

In 1988, President Ronald Reagan gave the station its original name - *Freedom*. In 1993, President Clinton called for the station to be redesigned to reduce costs and include international involvement. Three design options were created and the White House selected the "Alpha" option. After the Russians agreed to supply major hardware elements, many originally intended for their Mir 2 space station program, the station became known as the International Space Station.